IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Canceled)

2. (Currently Amended) A satellite positioning receiver capable of receiving at least three positioning signals, comprising:

a navigation processor that processes the at least three positioning signals and determines at least three code phases, [[;]] and determines a location of the satellite positioning receiver ~~determined from~~ based on initial digital terrain elevation data used to calculate a solution with the at least three code phases and an altitude equation derived from the initial digital terrain elevation data, wherein the solution further includes:

a horizontal error ellipse parameter in the altitude equation that forms an error ellipse having a major axis and a minor axis that corresponds to the altitude error, [[;]]

a plurality of points along the major axis and the minor axis that form a grid of grid points, and [[;]]

a two-dimensional polynomial surface fit over the grid points; and

a memory that ~~contains~~ stores digital terrain elevation data at the grid points.

3. (Currently Amended) The satellite positioning receiver of claim 2, further including:

a server that receives a plurality of satellite code phases wherein each of the satellite code phases is associated with a satellite position system signal over a wireless network; and

a controller in the server that accesses the initial digital terrain data in order to determine a solution.

4. (Currently Amended) The satellite positioning receiver of claim 2, wherein the initial digital terrain elevation data is retrieved from the memory in response to receipt of a signal other than the at least three positioning signals.

5. (Currently Amended) The satellite positioning receiver of claim 2, wherein the digital terrain elevation data in the memory is NIMA digital terrain elevation data (DTED) level 0 digital mean elevation data.

6. (Currently Amended) The satellite positioning receiver of claim 2, wherein the digital terrain elevation data stored in the memory is GTOPO30 Global Elevation data.

7. (Currently Amended) The satellite positioning receiver of claim 2, ~~further including:~~ wherein a residual error threshold ~~a maximum residual error~~ in the polynomial surface fit over the grid points is set at a predetermined level and ~~utilized~~ compared to the horizontal error ellipse parameter to determine whether the horizontal error ellipse parameter is below ~~a predetermined threshold~~ the predetermined level~~, where the maximum residual error is the largest determined residual error~~.

8. (Currently Amended) The satellite positioning receiver of claim 7, wherein the ~~predetermined~~ residual error threshold is 100 meters.

9. (Currently Amended) The satellite positioning receiver of claim 2, wherein the navigation processor is ~~a processor~~ located in a server.

10. (Currently Amended) A method of determining the location of a receiver in receipt of at least three positioning signals, comprising:

identifying a reference location with the at least three positioning signals;

retrieving an initial height of the receiver based on the identified reference location;

identifying a plurality of grid points located a predetermined distance from the reference location;

determining an average height of the receiver based on elevation information associated with the plurality of grid points;

determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the receiver ~~along with an average height error from the initial height~~;

deriving at least three simultaneous equations associated with the at least three positioning signals;

solving the at least three simultaneous equations with the average height of the receiver and the average height error value that results in a position and a corresponding horizontal error ellipse;

fitting a two-dimensional polynomial to the corresponding horizontal error ellipse; and

solving the at least three simultaneous equations and the two-dimensional polynomial that results in an altitude of the satellite positioning receiver.

11. (Canceled)

12. (Currently Amended) The method of claim 10, wherein retrieving [[an]] the initial height of the receiver further includes:

transmitting a plurality of code phases to a server where each of the code phases is associated with each of the positioning signals; and

accessing digital terrain data stored in a memory to retrieve the initial height of the receiver.

13. (Currently Amended) The method of claim 12, wherein the receiver is in communication with the server via a wireless network ~~is a cellular communication network~~.

14. (Currently Amended) The method of claim 10, wherein retrieving [[an]] the initial height of the receiver further includes:

receiving the initial height of the receiver from a memory located within the satellite positioning receiver.

15. (Currently Amended) The method of claim 10, further including:

acquiring ~~another~~ second height of the receiver using variables from the two dimensional polynomial; and comparing the difference between the ~~other~~ second height and altitude to a predetermined threshold.

16. (Currently Amended) The method of claim 15, wherein the predetermined threshold is 100 meters.

17. (Currently Amended) The method of claim 10, wherein the receiver is located in a server.

18. (Currently Amended) A satellite positioning receiver apparatus in receipt of at least three positioning signals, comprising:

means for identifying a reference location with. the at least three positioning signals;

means for retrieving an initial height of a satellite positioning receiver;

identifying a plurality of grid points located a predetermined distance from the reference location;

means for determining an average height of the satellite positioning receiver based on elevation information associated with the plurality of grid points and for determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the satellite positioning receiver; ~~along with an average height error from the initial height;~~

means for deriving at least three simultaneous equations associated with the at least three positioning signals;

means for solving the at least three simultaneous equations with the average height of the satellite positioning receiver and the average height error value that results in a position and a corresponding horizontal error ellipse;

means for fitting a two-dimensional polynomial to the corresponding horizontal error ellipse; and

means for solving the at least three simultaneous equations and the two-dimensional polynomial that results in an altitude of the satellite positioning receiver.

19. (Currently Amended) The apparatus of claim 18, wherein the <u>means for</u> determining [[an]] <u>the</u> average height <u>of the satellite positioning receiver</u> ~~means~~ further includes:

means for identifying one of a minimum height <u>of the satellite positioning receiver</u> and a maximum height <u>of the satellite positioning receiver</u>; and

means for setting the <u>average</u> height error <u>value</u> equal to the absolute value of the difference between the one of the minimum height <u>of the satellite positioning receiver</u> and the maximum height <u>of the satellite positioning receiver</u> and the average height <u>of the satellite positioning receiver</u>.

20. (Currently Amended) The apparatus of claim 18, wherein the means for retrieving an initial height <u>of the satellite positioning receiver</u> further includes:

means for receiving the initial height <u>of the satellite positioning receiver</u> from a server located in a wireless network.

21. (Original) The apparatus of claim 20, wherein the wireless network is a cellular communication network.

22. (Currently Amended) The apparatus of claim 18, wherein the means for retrieving an initial height <u>of the satellite positioning receiver</u> further includes:

means for receiving the initial height <u>of the satellite positioning receiver</u> from a memory located within the satellite positioning receiver.

23. (Currently Amended) The apparatus of claim 18, further including:

means for acquiring ~~another~~ <u>a second</u> height <u>of the satellite positioning receiver</u> using variables from the two dimensional polynomial; and

means for comparing the difference between the ~~other~~ <u>second</u> height <u>of the satellite positioning receiver</u> and altitude to a predetermined threshold.

24. (Original) The apparatus of claim 23, where the predetermined threshold is 100 meters.

25. (Currently Amended) A machine-implemented method for determining the location of a satellite positioning receiver in receipt of at least three positioning signals, the method ~~machine-readable signal bearing medium for satellite positioning receiver apparatus containing a plurality of machine-readable signals,~~ comprising:

~~means for~~ identifying a reference location upon receipt of at least three positioning signals;

~~means for~~ retrieving an initial height of the satellite positioning receiver;

identifying a plurality of grid points located a predetermined distance from the reference location;

~~means for~~ determining an average height of the satellite positioning receiver based on elevation information associated with the plurality of grid points;

determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the satellite positioning receiver ~~along with an average height error from the initial height~~;

~~means for~~ deriving at least three simultaneous equations associated with the at least three positioning signals;

~~means for~~ solving the at least three simultaneous equations with. the average height of the satellite positioning receiver and the average height error value that results in a position and a corresponding horizontal error ellipse;

~~means for~~ fitting a two-dimensional polynomial to the corresponding horizontal error ellipse; and

~~means for~~ solving the at least three simultaneous equations and the two-dimensional polynomial that results in an altitude of the satellite positioning receiver.

26. (Currently Amended) The ~~machine-readable signal bearing medium~~ machine-implemented method of claim 25, wherein the determining an average height ~~means~~ further includes:

~~means for~~ identifying one of a minimum height of the satellite positioning receiver and a maximum height of the satellite positioning receiver; and

~~means for~~ setting the height error value equal to the absolute value of the difference between the one of the minimum height of the satellite positioning receiver and the maximum height of the satellite positioning receiver and the average height of the satellite positioning receiver.

27. (Currently Amended) The ~~machine-readable signal bearing medium~~ machine-implemented method of claim 25, wherein the ~~means for~~ retrieving an initial height of the satellite positioning receiver further includes:

~~means for~~ receiving the initial height of the satellite positioning receiver from a server located in a wireless network.

28. (Currently Amended) The ~~machine-readable signal bearing medium~~ machine-implemented method of claim 27, wherein the wireless network is a cellular communication network.

29. (Currently Amended) The ~~machine-readable signal bearing medium~~ machine-implemented method of claim 25, wherein the ~~means for~~ retrieving an initial height of the satellite positioning receiver further includes:

~~means for~~ receiving the initial height of the satellite positioning receiver from a memory.

30. (Currently Amended) The ~~machine-readable signal bearing medium~~ machine-implemented method of claim 25; further including:

~~means for~~ acquiring ~~another~~ a second height of the satellite positioning receiver using variables from the two-dimensional polynomial; and

~~means for~~ comparing the difference between the ~~other~~ second height of the satellite positioning receiver and the altitude to a predetermined threshold.

31. (Currently Amended) The ~~machine readable signal bearing medium~~ method being implemented by a processor of claim 30, where the predetermined threshold is 100 meters.

32.-33. (Canceled)

34. (Currently Amended) A server, comprising

a transceiver that receives a plurality of satellite code phases;

a memory with digital terrain elevation data:

a controller that processes the plurality of code phases and accesses the digital terrain data in memory with an initial height of a receiver to determine a location of the receiver indicated by the plurality of satellite codes and the digital terrain data;

a message containing the location data sent from the transceiver;

a horizontal error ellipse parameter in an altitude equation that forms an error ellipse having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver;

a plurality of points along the major axis and the minor axis that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points: and a two-dimensional polynomial surface fit over the grid points.

35. (Currently Amended) The satellite positioning receiver of claim 2, wherein the solution further includes an initial height of the satellite positioning receiver taken from a height value ~~in the neighborhood~~ within a predetermined range of a pseudolite.

36. (Currently Amended) The satellite positioning receiver of claim 35, wherein the pseudolite is [[able]] configured to communicate with a wireless device.

37. (Currently Amended) The ~~satellite positioning receiver~~ method of claim 10, wherein the initial height of the receiver is taken from a height value ~~in the neighborhood~~ within a predetermined range of a pseudolite.

38. (Currently Amended) The ~~satellite positioning receiver~~ method of claim 37, wherein the pseudolite is [[able]] configured to communicate with a wireless device.

39. (Currently Amended) The satellite positioning receiver apparatus of claim. 18, wherein the initial height of the satellite positioning receiver is taken from a height value ~~in the neighborhood~~ within a predetermined range of a pseudolite.

40. (Currently Amended) The satellite positioning receiver apparatus of claim 39, wherein the pseudolite is [[able]] configured to communicate with a wireless device.

41. (Currently Amended) The machine-implemented method ~~satellite positioning receiver~~ of claim 25, wherein the initial height of the satellite positioning receiver is taken from a height value ~~in the neighborhood~~ within a predetermined range of a pseudolite.

42. (Currently Amended) The ~~satellite positioning receiver~~ machine-implemented method of claim 41, wherein the pseudolite is [[able]] to communicate with a wireless device.

43. (Currently Amended) The ~~satellite positioning receiver~~ server of claim 34, wherein the initial height of the receiver is taken from a height value ~~in the neighborhood~~ within a predetermined range of a pseudolite.

44. (Currently Amended) The ~~satellite positioning receiver~~ server of claim. 43, wherein the pseudolite is [[able]] configured to communicate with a wireless device.